

**CONCEPTUAL PRELIMINARY DESIGN OF A TRANSPLANTING  
MACHINE AT THE MAIN NURSERY**

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Peace and Blessings be Upon His Beloved Prophet**

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## **ABSTRACT**

### **CONCEPTUAL PRELIMINARY DESIGN OF A TRANSPLANTING MACHINE AT THE NURSERY**

Oil palm (*Elaeis guineensis*) is the most productive oil crop compared to the others major oil crops such as soy beans and sunflower. As the importance of this crop as the main economic contributors, good nursery management would be required to ensure the production of uniformly good and healthy seedlings from a nursery in order to achieve early bearing high yields in the field. In the double stage nursery, transplanting is one of the main process but there are many shortcoming from the conventional method that will decreased the productivity of work to be done. As the problem give a huge impact, a design concept of transplanting machine will be designed to fulfill the need. The concept design of the oil palm nursery transplanting machine for the main nursery polybag might be able to help in improving the field efficiency in the oil palm nursery compared to the conventional method in the transplanting process. With the ability to work independently and faster compared to the man power, transplanting work in the main nursery will no longer considered as the most drudgery work in the nursery.

## CHAPTER 1

### INTRODUCTION

#### 1.1 Introduction and Problem statement

Oil palm (*Elaeis guineensis*) is the most productive oil crop compared to the others major oil crops such as soy beans and sunflower. It is ten times much higher of oil yield per hectare compared to the others oil crops and contribute up to 32% of world oils and fats production in 2012. According to the Malaysian Palm Oil Board (MPOB), the total area planted in Malaysia for the year of 2015 has reached 5,642,943 ha. This planting area has been increased 0.643 million hectare for the last four years since 2011 till 2015. For the development of the country and providing world supply of dietary oils, palm oil production has been an important sector. This sector has been the main crop for Malaysia in strengthens the economy from the agronomic sector. Therefore, the oil palm sector is proven to be an important economic crop.

In the double stage nursery, transplanting is one of the main processes. In transplanting process, worker is needed to get rid of the abnormal and disease seedling before planting it in the bigger polybag. The process called as culling. Transplanting of oil palm plantlet into the main nursery from the pre-nursery is the hardest work to do in nursery. It requires more time and more energy to complete the process. The process is including opening the small polybag, dig the soil in the big polybag and put the plantlet in the big polybag. Tools that are needed to do the replanting are trowel or cylindrical core cutter. These tools will drain the worker energy fast as the tools only working if they highly use